

FIG. 1



Input:  $|\chi\rangle, |I_\tau(\chi)\rangle = |0\rangle, |w\rangle = |0_{\lceil \log n \rceil}\rangle$

```
1:  for  $i = 1$  to  $n$  do
2:    if  $(|\chi_i\rangle = |1\rangle)$  then
3:       $|w\rangle \leftarrow |w + 1\rangle$ 
4:    endif
5:  endfor

6:  if  $(|w| \geq |\tau|)$  then
7:     $|I_\tau(\chi)\rangle \leftarrow |I_\tau(\chi) \oplus 1\rangle$ 
8:  endif

9:  for  $i = n$  to  $1$  do
10:   if  $(|\chi_i\rangle = |1\rangle)$  then
11:      $|w\rangle \leftarrow |w - 1\rangle$ 
12:   endif
13: endfor
```

Output:  $|\chi\rangle, |I_\tau(\chi)\rangle, |w\rangle = |0_{\lceil \log n \rceil}\rangle$

FIG. 2

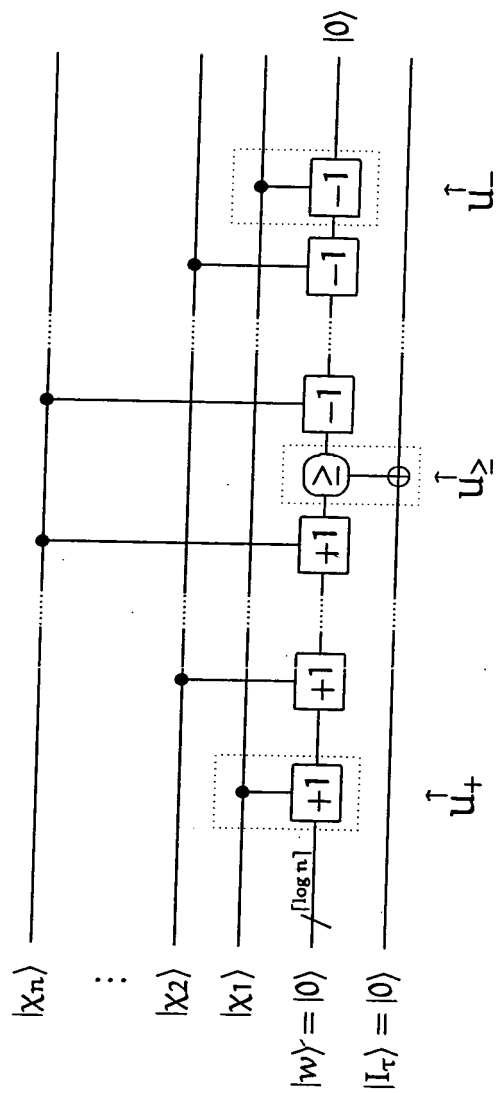
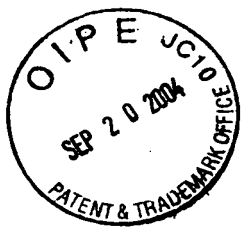


FIG. 3

Input:  $|A\rangle, |B\rangle, |R\rangle, i, |T\rangle = |0_{tq}\rangle$

```

1:  $|R\rangle \leftrightarrow |T_{[(i-1)q+1, i]}\rangle$ 
2: for  $j = (i-1)q$  to  $i$  do
3:   if  $(|A_{[i,j]}\rangle = |1\rangle)$  then
4:      $|T\rangle \leftarrow |T + B2^{-j}\rangle$ 
5:   endif
6:   if  $(|T\rangle \geq |B2^{-j}\rangle)$  then
7:      $|A_{[j,i]}\rangle \leftarrow |A_{[i,j]} \oplus 1\rangle$ 
8:   endif
9:    $|T_{[i,q]}\rangle \leftrightarrow |A_{[i,q]}\rangle$ 
10: endfor

```

Output:  $|A\rangle \leftarrow |AB + 2^{-(i-1)q-1}R\rangle,$   
 $|R\rangle = |0_q\rangle, |T\rangle = |0_{tq}\rangle$

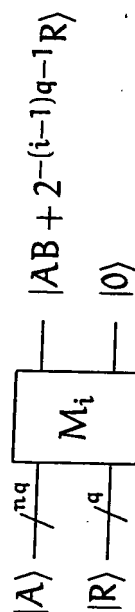


FIG. 4



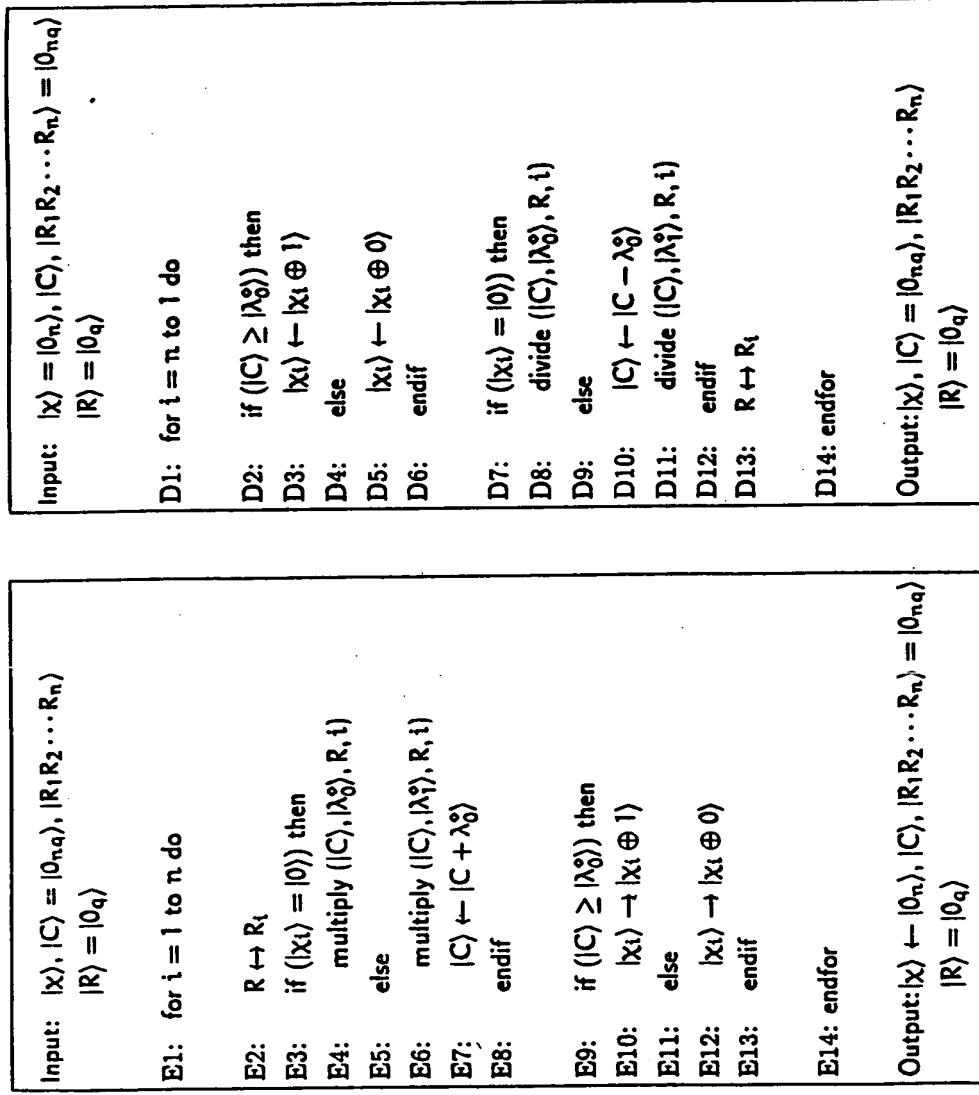


FIG. 6

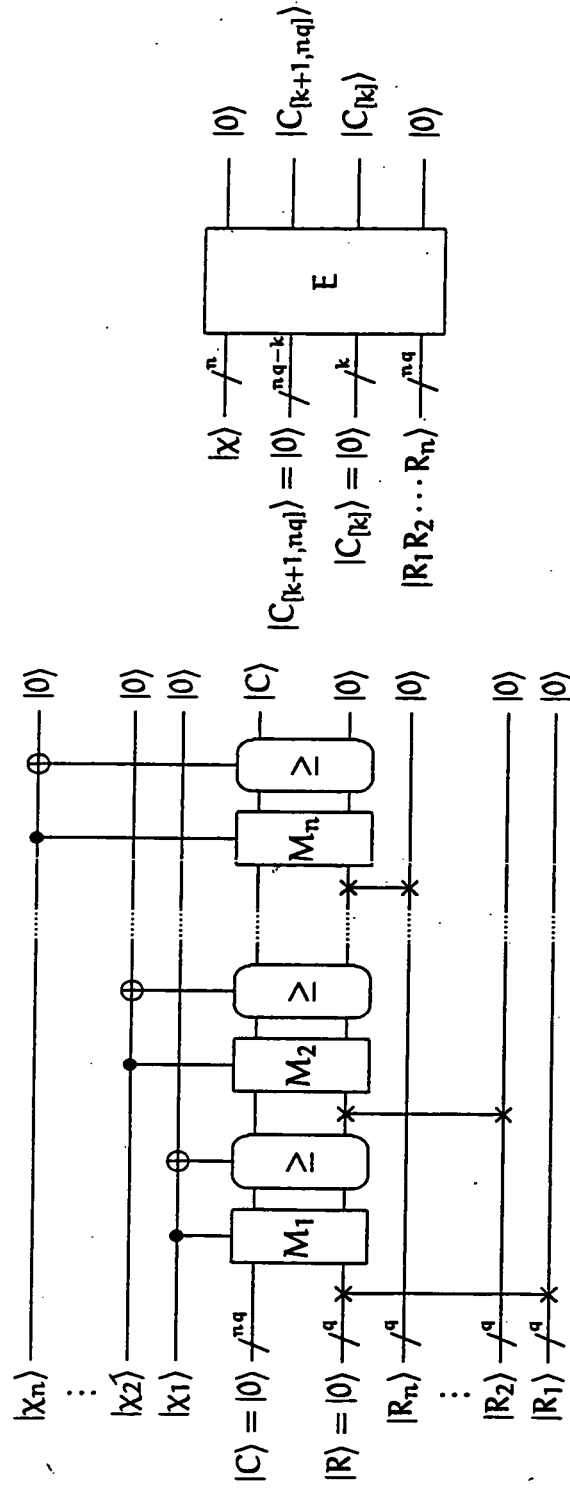


FIG. 7

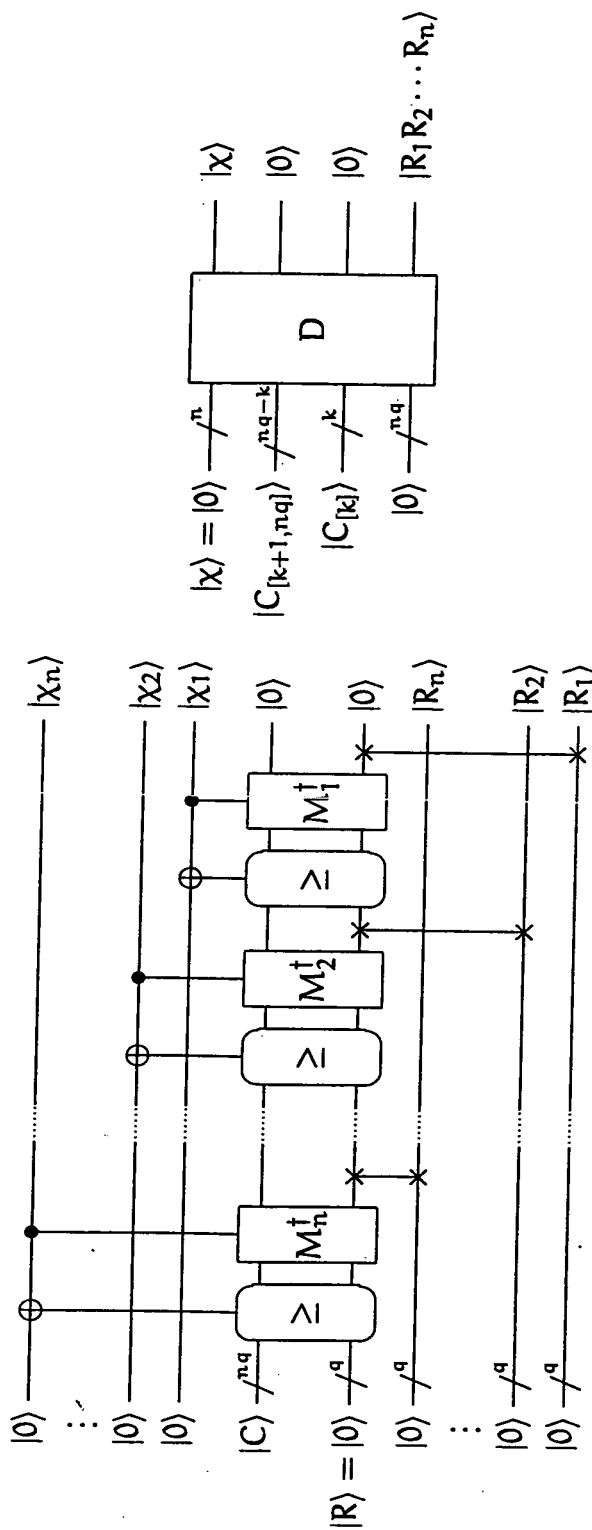


FIG. 8



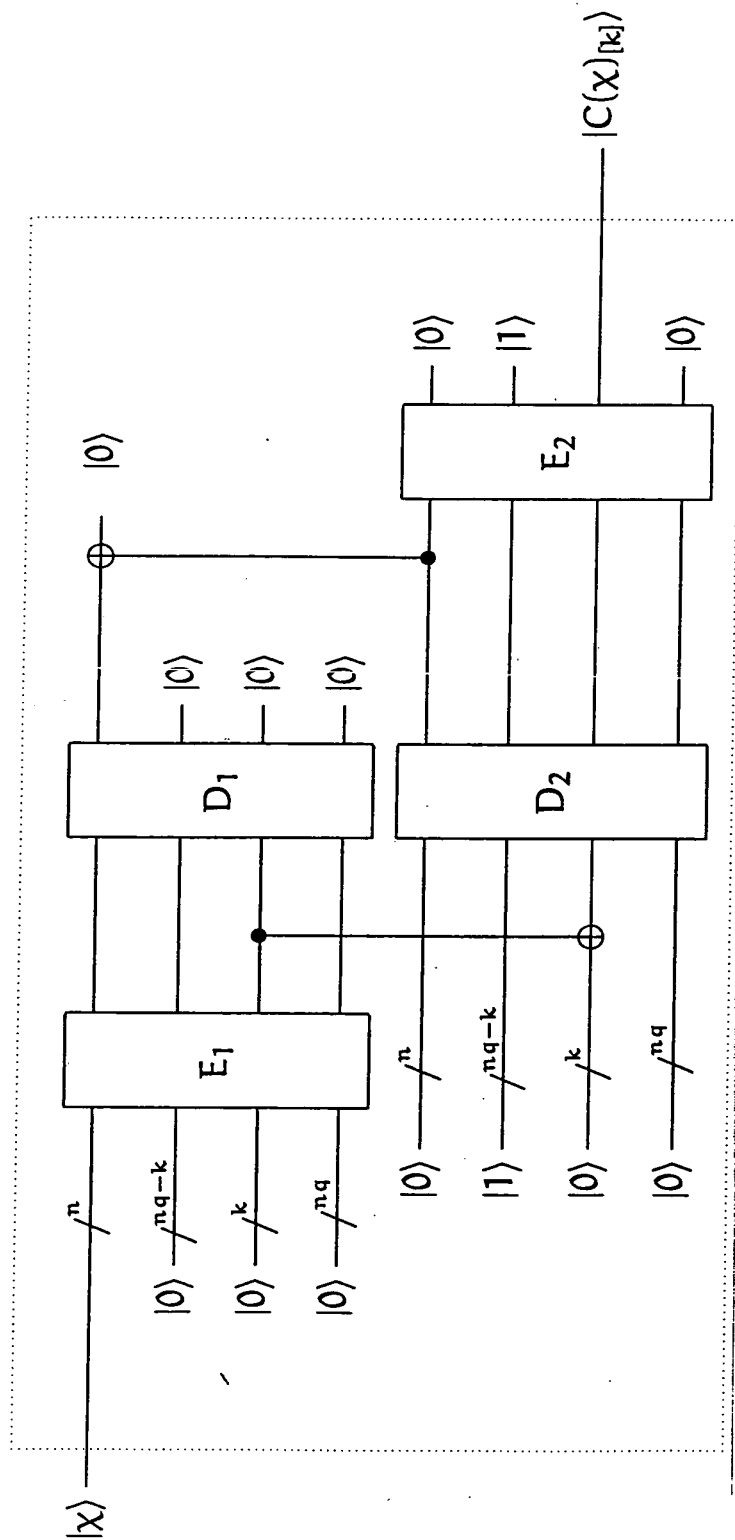


FIG. 9

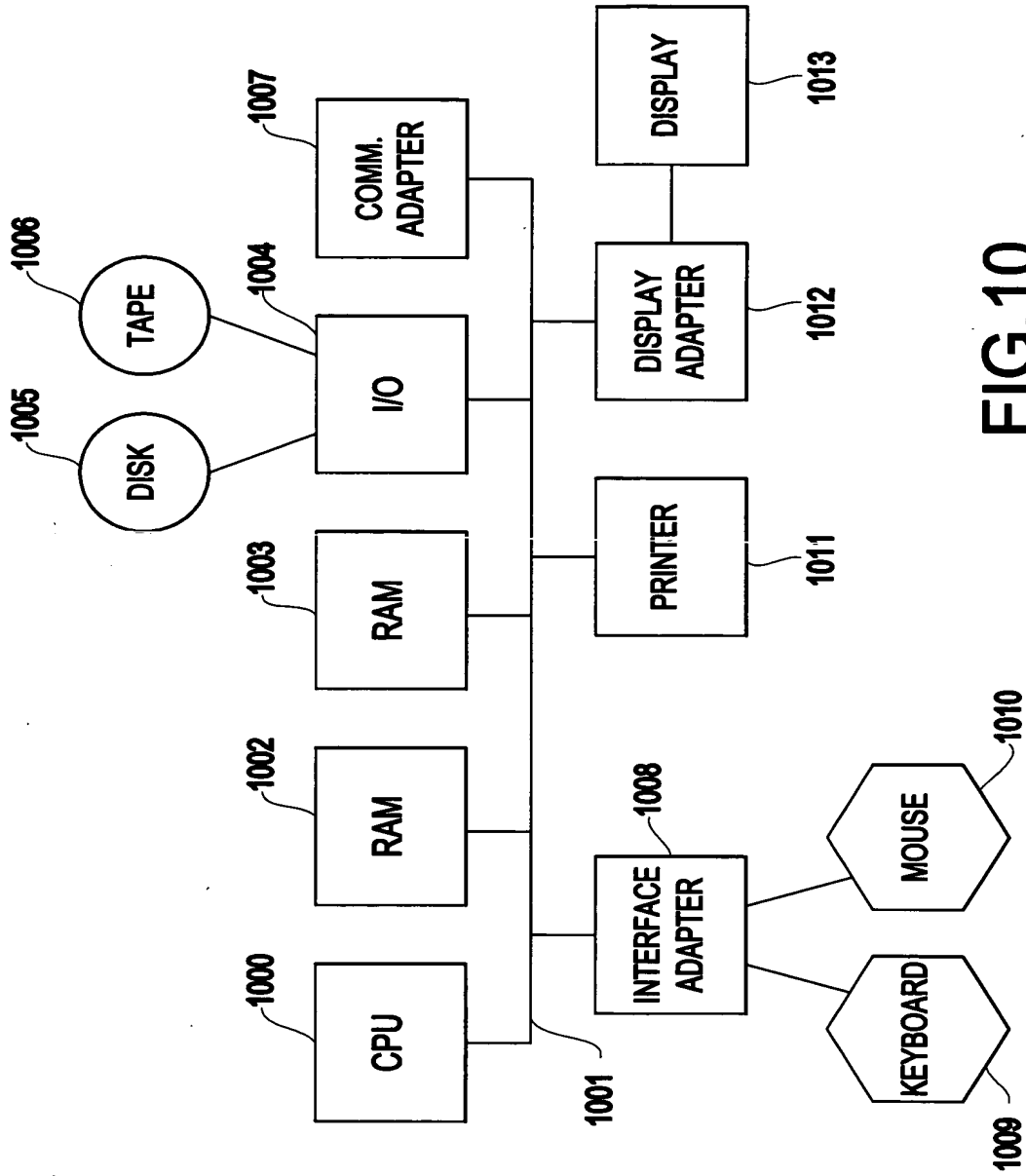


FIG. 10